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| 10/566,855 | 01/16/2008 | Carl Towns | 30698/CDT445 | 9774 |
| 4743 7590 02/24/2011 MARSHALL, GERSTEIN & BORUN LLP 233 SOUTH WACKER DRIVE 6300 WILLIS TOWER CHICAGO, IL 60606-6357 | | | EXAMINER WILSON, MICHAEL H | |
| | | | ART UNIT 1786 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mgbdoCKET@marshallip.com

Office Action Summary

Application No.

10/566,855

Applicant(s)

TOWNS ET AL.

Examiner

MICHAEL H. WILSON

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060130; 20070814</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 15, the claim recites "a polymer as defined in claim 1". However, the scope of the claim is confusing given that claim 1 is drawn to a device and not a polymer. Further, if claim 15 were amended to recite "the device as defined in claim 1", it would be unclear if the claim is reciting a device or a composition. A dependent claim automatically inherits all the limitations of the parent claim and should narrow in scope of the parent claims. If the claim is intended to be drawn to a composition and not a device it is suggested to rewrite the claim in independent form.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 1, 2, 6, 7-9, 11, 12, 14, 15, 16, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Treacher et al. (WO 02/077060 A1), English equivalent US 2004/0135131 A1 relied upon.

Regarding claims 1, 2, 6, 7-9, 11, 12, 14, 15, 16, and 19, Treacher et al. disclose an electroluminescent device comprising an anode and a cathode with a light-emitting layer between the electrodes ([0135], [0136], and [0223]). The light-emitting layer comprises a polymer ([0135], [0136], and [0223]) and a metal complex which is phosphorescent [0113]. The polymer also comprises a repeating unit of instant formula (I) ([0071] and monomer M11 page 16). The polymer also comprises fluorene or spirobifluorene units ([0018], [0019], and [0211]) and can be an alternating polymer (i.e. AB polymer) [0065]. The metal complex is disclosed to be incorporated into the main polymer chain ([0112] and [0113]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 13, 17, 18, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Treacher et al. (WO 02/077060 A1), English equivalent US 2004/0135131 A1 relied upon, as applied to claims 12 and 16 above in view of Holmes et al. (US 2006/0063026 A1).

Regarding claim 13, Treacher et al. discloses all the claim limitations as set forth above. The reference discloses wherein the metal complex can be incorporated into the main polymer chain or bound as a substituent to a fluorene or spirobifluorene unit [0112]. However the reference does not explicitly disclose the metal complex as an end group of the polymer.

Holmes et al. teach a similar polymer and light-emitting device (abstract). The reference teaches the metal complex can be used as a capping group for the end of the polymer to terminate polymer chain propagation ([0063]-[0067], [0074], and [0078]-[0081]).

It would be obvious to one of ordinary skill in the art at the time of the invention to try and use the metal complex as an end group for the polymer of Treacher et al. as taught by Holmes et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that both references teach phosphorescent light-emitting devices with metal complexes incorporated into a polymer chain. One of ordinary skill would be motivated by a desire to control the termination step in forming the polymer.

Regarding claims 17, 18, 20, and 21, Treacher et al. discloses all the claim limitations as set forth above. The reference discloses wherein the metal complex can be incorporated into the main polymer chain or bound as a substituent to a fluorene or spirobifluorene unit [0112]. The reference also discloses triarylamine units for the polymer (page 16, M11). However the reference does not explicitly disclose wherein the metal complex is bound to a unit of instant formula (I).

Holmes et al. teach a similar polymer and light-emitting device (abstract). The reference teaches the metal complex can be bound to the side of a monomer unit [0082]. The metal complexes meet the formula $ML^1_qL^2_rL^3_s$ of instant formulae (XII) and (XIII) [0047]. The reference teaches that the metal complex can be bond to a triarylamine unit [0090] via the ligand of the metal complex ([0082]-[0090]). The reference teaches the monomer has two polymerisable groups selected from halides, boranes, boric acids and boric esters [0082].

It would be obvious to one of ordinary skill in the art at the time of the invention to try attaching the metal complex to the triarylamine monomer unit and using the monomer unit in the polymer of Treacher et al. as taught by Holmes et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable because both references teach similar phosphorescent polymers containing metal complexes and both references teach that the metal complex may be bound to a side chain of the polymer.

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8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Treacher et al. (WO 02/077060 A1), English equivalent US 2004/0135131 A1 relied upon, as applied to claim 1 above in view of Lee et al. (US 2003/0008175 A1).

Regarding claim 10, Treacher et al. disclose all the claim limitations as set forth above. Additionally the reference discloses the polymer to have arylamine units of formula (III) and can also have carbazole repeating units of formula (XII) [0071]. However the reference does not explicitly disclose the carbazole repeating unit meeting instant formula (IV).

Lee et al. teaches another polymer for a light-emitting device [0002]. The reference teaches using N-arylcarbazole repeating units ([0034], [0036], [0043], and [0051]). The reference teaches using these units to control the hole transporting property, HOMO/LUMO, and thermal stability of the polymer [0038].

It would be obvious to one of ordinary skill in the art at the time of the invention to use the carbazole units of Lee et al. in the polymer and device of Treacher et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Lee et al. teach the units for a luminescent polymer used in a similar light-emitting device and Treacher et al. teach carbazole as a suitable polymer unit. One of ordinary skill in the art would be motivated by a desire to control the hole transporting property, HOMO/LUMO, and thermal stability of the polymer.

9. Claims 1-7, 9, 11, 12, 14, 15, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikehira et al. (US 2002/0193532 A1).

Regarding claims 1-7, 9, 11, 12, 14, 15, 16, and 19, Ikehira et al. disclose a light-emitting device comprising an anode, cathode and a light-emitting layer between the two electrodes [0179]. The light emitting layer comprises a polymer [0097] and a metal complex [0044]. The polymer is disclosed to have units meeting instant formula (I) ([0065], [0071]) and repeat units which are non-conjugated including $-(CRR)-$ [0078] wherein R may be hydrogen or an alkyl group [0018] and can also have units which are conjugated aryl groups including phenylene, oligophenylene, and fluorene [0051]. The reference discloses the metal complex to be phosphorescent and bound to the polymer ([0037] and [0044]). While the reference does not explicitly exemplify a polymer with the repeating units as set forth above, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a phosphorescent polymer with the repeating units disclosed by Ikehira et al. and cited above given that Ikehira et al. teach each one.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hosokawa et al. (US 2002/0045061 A1) discloses an electroluminescent device with a carbazole host material for a phosphorescent light-emitting layer.

Kamatani et al. (US 2003/0186080 A1) and Tokito et al. (US 2003/091862 A1) discloses a phosphorescent polymer for the light-emitting layer of an electroluminescent device.

Maxted et al. (WO 03/074628 A1) discloses a polymer comprising units of CBP as the host material for a phosphorescent light-emitting layer of an organic electroluminescent device.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL H. WILSON whose telephone number is (571)270-3882. The examiner can normally be reached on Monday - Thursday 7:30-5:00 (EST), Friday 7:30-4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MHW

/Callie E. Shosho/
Supervisory Patent Examiner, Art Unit 1787